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3 April 1981

# Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION

No. 89



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## WORLDWIDE AFFAIRS

### BRIEFS

FRANCE OFFERS BRAZIL URANIUM--During a recent contact with ELECTROBRAS [Brazilian Electric Power Companies, Inc.], France offered enriched uranium to Brazil. So far, however, no negotiations have been initiated. If approved, the project will absorb the surplus of the fuel produced by the Eurodif consortium, in which France is the largest stockholder, to be used by the Angra Dos Reis nuclear plants. Eurodif sources feel that the offer is quite advantageous for Brazil, because it would offer an alternative to one of the arrangements with Germany. Eurodif is not concerned over the fact that Brazil has not yet adhered to the Nuclear Nonproliferation Treaty, being satisfied with the guarantees given by the country to the International Atomic Energy Agency. [Text] [PY141747 Sao Paulo FOLHA DE SAO PAULO in Portuguese 13 Mar 81 p 1]

CSO: 5100

## PHILIPPINES

### BRIEFS

NUCLEAR PROJECT HALT URGED--An American nuclear safety engineer has urged the Philippines to abandon the Bataan Nuclear Plant project, because it is dangerously unsafe and very expensive. The engineer, Robert D. Pollard of the Union of Concerned scientists, said the plant cannot be licensed in the United States. He said the contract lacked some important requirements that will insure it from an accident similar to that of the Three Mile Island Nuclear Plant. The American nuclear expert also said the Bataan Nuclear Plant will likely pose serious economic problems to the country because of breakdowns similar to that being experienced in the United States and other countries. On the other hand the government has insisted that the Bataan Nuclear Power Plant has been pronounced safe by Edward Teller, a world-renowned American physicist. Teller was in Manila recently during the International Conference on Energy. [Text] [HK200508 Manila FEBC in English 0400 GMT 20 Mar 81]

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# NO U.S. OBJECTION EXPECTED TO USSR NUCLEAR DEAL

PY140235 Buenos Aires TELAM in Spanish 1900 GMT 13 Mar 81

[Text] Buenos Aires, 13 Mar (TELAM)--Vice Adm Carlos Castro Madero, chairman of the National Atomic Energy Commission [CNEA], today said that he does not believe that U.S. President Reagan will raise any objections about the heavy water that Argentina purchased from the USSR during the meeting he will hold next week with Argentine president-designate Gen Roberto Viola.

Admiral Castro Madero made this statement during a brief press conference he held at CNEA after the signing of two agreements by the chairmen of the Argentine and Uruguayan nuclear energy organizations. He added that the purchase of heavy water from the USSR should not cause any concern to the United States, since it will be used in the Atucha 1 nuclear plant to replace losses occurring naturally with the passage of time.

Answering another question, he said that he does not believe that there will be any changes in the CNEA budget once the new officials assume their duties, since this was agreed ahead of time and since the CNEA is doing its share to decrease government spending. He added that the heavy water plant that is under construction and the plant at Embalse will not experience any delays.

Regarding the cooperation agreements signed today with Uruguay, Castro Madero said that this example must be followed in other parts of the American Continent. Moreover, the chairman of the Uruguayan National Atomic Energy Commission, Pablo Banales, said that through the cooperation offered by Argentina, Uruguay will be able to develop its own nuclear technology, since Argentina is a highly developed country in the nuclear field. He noted that Argentina is more advanced than Uruguay in both quality and quantity because of the time that it has been involved in this activity, and that he is quite happy that through this cooperation program Uruguay will soon have its own nuclear center, which is something Uruguay urgently needs.

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TECHNOLOGY TRANSFER ADVOCATED FOR NUCLEAR AUTONOMY

Mexico City EL SOL DE MEXICO in Spanish 18 Feb 81 p 3-F

[Article by Rosendo de la O Rendon]

[Text] Acapulco, Guerrero (OEMM)--By means of the transfer of technology, Mexico could achieve autonomy in the nuclear field, Alberto Escoffet Artigas, director of the Federal Electricity Commission (CFE), said in his speech inaugurating the work of the third nuclear conference being held in the Acapulco Center in this city.

The speaker mentioned the indebtedness from which the CFE suffers in the course of his speech, stating that it is due to the fact that this body is the only beneficiary of credit on the international level, for which reason it is the channel for the kinds of nuclear energy resources the country needs from abroad, in addition to which the annual growth rate at the CFE is 10 percent in terms of the need.

In other words, it is 10 percent in terms of comparison with the requirements of the country.

He also said that within the energy program, the needs set forth for Mexico come to no less than 20,000 megawatts generated by the nuclear plants to be built, which are expected to go into operation at the end of this century, as one of the means of diversifying the primary energy sources.

Great effort and great decision is required in these tasks, since they demand properly coordinated labor and a very clear definition in technology transfers until the desired autonomy of decision is achieved.

In addition, Escoffet Artigas said, this third labor meeting has as its primary purposes the exchange of aid, advice and support, since these are necessary in the era in which we live.

For Mexico and for the CFE in particular, Escoffet Artigas said, the definition of this program allows us to develop plans for growth, and on this basis we can insure an installed kilowatt capacity in excess of 2.5 million by 1990.

To expand the work mentioned above, the details are being perfected for an appeal for cooperation, because in addition, it is hoped to double this capacity and it is expected that 550 billion kilowatt hours will be in use in this cooperation soon to be launched among the nations--essentially France, Sweden, Great Britain, the United States and Germany.



In discussing the indebtedness from which the CFE suffers, the speaker noted that this is due to the fact that the CFE is the only nationalized enterprise benefiting from credit on the international level, and for this reason, all of the kinds of nuclear energy resources the country requires are channeled through this credit, and in addition, the average annual rate of growth is 10 percent, where the generation of electrical energy to meet the needs of the country is concerned.

Shortly after the commissioning ceremony held at midday at the Acapulco Center, the president of the American Nuclear Society, Harry Lawrousky, was interviewed. He answered in response to questions posed that the President of the United States, Ronald Reagan, better understands the problem of nuclear energy and on this basis will seek the participation of other countries until the nuclear energy development each country needs is achieved.

As to a possible program for transfer between Mexico and the United States, Harry Lawrousky expressed the view that his country will always favor the signing of agreements by means of which mutual benefits are sought. He also denied that his country has decreed any uranium embargo with regard to Mexico. "I believe that it is all due instead to bureaucratic procedures which could be completed at any time."

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## URANIUM PURCHASED FROM PORTUGAL IN 1980

London 8 DAYS in English 28 Feb 81 p 32

[Text] PORTUGAL last year sold 120 tonnes of uranium to Iraq, but made it clear it was not Lisbon's concern how the shipment was used. Sources in the state-owned National Uranium Company (ENU) said the contract was 'absolutely normal' in the eyes of international law. Portugal and Iraq were both signatories to the Nuclear Non-proliferation Treaty, and if Baghdad decided to break this and use the uranium for military purposes it was no business of the Portuguese, they added.

Not that there is any evidence of that happening. Iraq has constantly denied that its nuclear plans are anything other than peaceful. There has been some clamour, particularly in some sections of the western press, that Iraq was planning to use the nuclear technology it is acquiring from the French and the Italians for military purposes, but there is strong evidence that the whole campaign is being promoted, if not orchestrated, by Israel.

Iraq provided 45 per cent of Portugal's oil imports last year, and reports in Lisbon suggested that the deal was conditional on Lisbon supplying uranium for Baghdad's nuclear development programme. Iraq already operates an experimental nuclear reactor and its first nuclear power station is under construction.

However, ENU sources said all uranium sales between signatories of the Nuclear Non-proliferation Treaty were registered by the International Atomic Energy Commission (IAEC) and material purchased in this way could be used for peaceful purposes only. If Iraq chose to contravene the treaty, it was a matter between that country and the IAEC only.

The metal leaves Portugal in the form of unenriched uranium oxide or yellow cake, a fine orange-coloured powder of low radioactivity, packed in ordinary drums.

The socialist newspaper *Portugal Hoje* reported that uranium shipments worth almost \$12m made up 61 per cent of Portuguese exports to Iraq in the first half of 1980. Portuguese exports to Baghdad also included \$2m worth of gunpowder and explosives, it added.

# REPORT ON URANIUM EXPLORATION IN 1980, 1981 ESTIMATES

Brazzaville ETUMBA in French 14 Feb 81 p 8

[Article by Andre Missamou]

[Text] Our country, the People's Republic of the Congo, a small oil producer that is nevertheless entering the phase of the development of the oil industry, does not only conceal petroleum in its subsoil, but unsuspected mining resources as well.

The constant concern of our political and administrative officials over the socio-economic development of our country has enabled our government to sign a long-term agreement with AGIP SPA [National Italian Oil Company] of Rome (Italy) on 24 April 1979 for the exploration of one of our resources: uranium ore.

Beginning with that agreement, AGIP SPA, whose partners are AGIP-Research for oil research and AGIP-Uranium (Ltd) for uranium ore research and production, entrusted the noble task to the latter. A team from AGIP-Uranium (Ltd), a Congo branch, has begun its research work on radioactive ores and related substances on the concession called Niari, which covers an area of 36,000 km<sup>2</sup>.

In October 1979, the first meeting of the board was held in Pointe-Noire and brought together the representatives of AGIP-Uranium (Ltd) and our government. Another meeting was then held on 17 June 1980 to evaluate preliminary work completed (basic geological surveys, revision of the 1980 technical-economic program, 1979 balance sheet, and so on).

According to information from the second board meeting held during the 1980 season, AGIP-Uranium (Ltd), a Congo branch, has completed research work at Bouenza (Boko-Songho), Lekoumou (Sibiti) and Mayombe. Geophysical surveys from the air and geological, geochemical and radiometric studies have been completed.

On 24 November 1980 in Pointe-Noire, AGIP-Uranium (Ltd), the first company to complete systematic uranium research in our country, held its third meeting of the board of directors and technical committee, with the participation of members of AGIP-Uranium (Ltd), Andre Massengo, Remy-Victor Okandze and a comrade from the Ministry of Mines in Pointe-Noire, representing the Congo.

Opening the third meeting of the committee and board, Prato, general director of AGIP-Uranium (Ltd), carefully described the results of exploration during the 1980 period and presented technical-economic plans for 1981, including:

1) the continuation of geological and radiometric surveys in the Bouenza and Lekoumou regions; and

2) the geo-radiometric definition of all of Mayombe.

Prato also said that after studying the entire area of the concession, AGIP-Uranium (Ltd) will have the elements it needs for the programming of more detailed operations in specific zones.

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## ISRAEL, SOUTH AFRICA SAID TO BE DEVELOPING NUCLEAR SUBMARINE

London 8 DAYS in English 28 Feb 81 p 2

[Text]

*Last week's reports of yet another 'mysterious flash' off the coast of South Africa have fuelled more rumours that the republic is now testing a nuclear device. To add to this come reports - hotly denied by the Israelis - that well established links between Israel and S. Africa on arms development now include work on a nuclear submarine.*

SHIELDED by the tightest security measures ever taken in South Africa, Israeli and South African scientists and engineers are secretly building a nuclear submarine at Simonstown, the sprawling Indian Ocean naval base near Capetown.

For months there have been vague rumours that the South Africans were planning such a submarine. But now confirmation that work has indeed begun on the project - and that the Israelis are involved - comes from an individual closely involved in South Africa on the project.

The man, who does not wish to be identified, said the project was sufficiently advanced for the South Africans to begin preliminary work on a new submarine pen, also in Simonstown, specifically designed for the nuclear submarine.

This development, which dramatizes the expanding Israeli-South African military partnership, is a direct result of the secret visit made by General Weizman, the then Israeli defence minister, to South Africa in the middle of March last year. It was reported then that an arms deal had been signed. But both the South African and Israeli defence ministries hotly denied that the visit had taken place - even though, curiously, Israeli radio announced that Weizman had reported directly to Prime Minister Begin on his return from Pretoria.

In another development which will also have far-reaching consequences, South Africa is secretly providing financial support for the development of Israel's newly-designed Lavi fighter-bomber which will take the Israeli air force into the 1990s. As part of the deal, the Lavi will ultimately be built under licence in South Africa and become the main component of its air strike capability.

The Israelis need \$1bn to develop the plane. On 13 February the director general of the Israeli defence ministry, at the annual conference on aviation and electronics in Tel Aviv, hinted at the South African participation. 'It is possible,' he said, 'that we would recruit partners for its production because we must ask ourselves whether we would have the capacity to continue the development of this fighter plane.'

Israel is already a main supplier of the South African navy. Three Reshaf class missile boats have been delivered to South Africa. They were built at Haifa, and South African engineers were trained on the project. Now these engineers, it has been confirmed, are building three more Reshaf class missile boats under licence in South Africa.

The ships supplied are equipped with sophisticated Israeli Gabriel surface-to-surface missiles. But the South Africans, again with Israeli assistance, intend installing their own home-produced missiles on at least some of the new boats. With the nuclear submarine, these missile boats will be powerful additions to the South African navy. Prime Minister Botha once described them as 'missile carrying assault craft with the hitting power of a second world war battleship.'

The Israeli-South African military connection was forged at the time of the Arab-Israeli war in 1967 when General Charles de Gaulle imposed an arms

embargo against Israel. South Africa, whose air force is equipped with similar French-built Mirages, came to Israel's rescue with spares and ammunition for its aircraft and weapons.

Later, the South Africans played a vital role in developing Israel's Chariot tank which uses an advanced type of armour plating. According to Robert Moss, the British commentator on intelligence matters, the Israelis had developed the armour plating by injecting a chemical mix into special steel. But having arrived at the formula they found it difficult to import the right steel because the Americans refused supplies and pressured West European suppliers to do likewise. The South Africans once more came to the rescue. The Israelis reciprocated by refitting the South African army's Centurion tanks and Panhard armoured cars with the special plating.

Moss says the Israelis 'regard their little publicised military relationship with South Africa as a lynchpin of their own defences.' He has also disclosed that the Israelis, with discreet encouragement from Dr Henry Kissinger, supplied equipment, technicians and military intelligence to help the South Africans when they invaded Angola.

The growing collaboration between Israel and South Africa, according to the UN committee against apartheid, 'has provided each country with an additional source of arms, spies and technological know-how, as well as access to classified information on strategies and tactics.'

## SAFETY SUPERVISION OF VVER-440 NUCLEAR POWER PLANTS

Budapest ENERGIA ES ATOMTECHNIKA in Hungarian Vol 33 No 11, Nov 80 pp 520-521

[Article by M.P. Alekseyev, deputy president of Gosgortekhnadzor (State Mining Technical Directorate), USSR]

[Summary] Nuclear power plants in general and VVER-440 power-plant blocks in particular are safety-checked by the Gosgortekhnadzor for technical safety, by the Gosatomnadzor (State Nuclear Inspectorate), and the Gossannadzor (State Health Inspectorate). The regulations laid down in the Rules Governing the Construction and Safe Operation of Power-Plant, Experimental, and Research Reactors; the strength calculations promulgated for reactors, steam generators, and pressurized systems; and the regulations governing welding and welded-joint inspection are observed in the safety checks. A team of inspectors performs a check every six months to ascertain proper and safe operating practices, compliance of the power plant with the applicable standards and regulations, and any repairs for possible effects on safety and performance. Spotchecks are also carried out in irregular intervals. Wherever appropriate, the suppliers of the power plant are also subjected to spotchecks. The power-plant operator attends the checks, of which the results are recorded in a report. The report also lists any work that must be performed to rectify deficiencies. The operation of the power plant is additionally evaluated in annual operations checks, where all operating factors are evaluated, including the proficiency of the personnel, maintenance practices, safety monitoring, and so forth. Any work mandated by the inspectors must be completed within the deadline, which is always stated. Special inspection procedures apply during construction of the reactor and startup. The duties, rights, and procedures of the inspection organs and inspectors are clearly laid down in the applicable regulations. No references.

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## EEC REPORT URGES NUCLEAR ENERGY DEVELOPMENT

Paris LE MONDE in French 22-23 Feb 81 p 12

[Article by H.S.]

[Text] Brussels (European Communities)--The member states of the EEC should pay greater attention to implementation of their nuclear energy and coal programs. Should they fail to do so, the consumption of oil by the 10 countries will be 50 million tons greater in 1990 than it is today. That is the warning issued by the European Commission in a report transmitted to the capitals of Europe on 19 February. The Commission also came out unequivocally in favor of nuclear energy "which unquestionably is the most advantageous means of producing electricity," while the construction of power plants fueled by oil and gas is to be considered "a bad investment."

Using as a point of departure the forecasts for growth in energy consumption by member states--4.3 percent average annual increase until 1990--and investments earmarked for construction of nuclear energy and coal power plants, the Commission estimates that these two sources would be able to meet the need for electricity of the 10 countries to the end of this decade. However, delays in the implementation of nuclear energy programs are already endangering the attainment of these objectives. According to the Commission, it is probable that the installed capacity in 1990 will be 20 percent lower than the planned program. Because the cost of electricity produced by using fuel oil is 50 percent higher than the cost of electricity produced by nuclear energy, "the Community is paying dearly for delays incurred by the nuclear energy program."

The Commission goes on to say that member states should step up their orders for power plants over the next 3 years. As for countries without nuclear energy programs, they should change their policy as soon as possible. This invitation is addressed to all EEC governments, except France, which appears to be the only state capable of attaining the 75 percent objective. The Commission is most worried about Italy, the Netherlands and Ireland and is advocating "firm emergency measures" for these countries. The cost of electricity, the Commission concludes, could by far exceed the desirable level in these countries and the reliability of supplies could be compromised.

The Commission's position is less clear-cut regarding coal-fired power plants. Of course, "member states should take another look at and keep in mind the



question of conversion to coal...of the power plants now operating on fuel oil and very shortly the question of ordering new power plants using solid fuel." However, for the moment, investments in this sector, even if desirable from the strategic point of view, are difficult to justify on the basis of economic and commercial criteria.

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## BRIEFS

**SOCIALISTS SUPPORT NUCLEAR ENERGY**--Michel Rocard, member of the executive committee of the Socialist Party (PS), reaffirmed the solidarity of the PS "with all ecological questions relating to nuclear energy" on Friday, 20 February, at the Brest mayor's office where he met with a delegation from the Plogoff antinuclear energy committee. However, Rocard added, "I am afraid that we will be unable to totally avoid nuclear energy because of our energy dependency. We do not accept the rationale which consists of putting the brakes on one source of energy while favoring others.... We must minimize the risks by diversifying our supplies." Rocard is making a 2-day tour of Brittany to support Francois Mitterrand's campaign. [Text] [Paris LE MONDE in French 22-23 Feb 81 p 12] 8143

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DEBATE ON NECESSITY, SAFETY OF NUCLEAR POWER CONTINUES

Duesseldorf WIRTSCHAFTSWOCHE in German 20 Feb 81 pp 28-36

[Text] The struggle began on a February morning in 1975. Backed up by water cannons, 400 Alert Police cleared off environmentalist occupiers from the construction site of the planned nuclear power plant at Wyhl, in Baden. A few days later--following a mass rally--demonstrators again stormed the construction site and drove off the officials who had remained behind there. This unfamiliar opposition rattled the land government, and it recommended a temporary stoppage of construction. "Wyhl will not be built," swore the citizens' initiatives resolutely.

"Without the Wyhl nuclear power plant, by the end of the decade the lights will start to go out in Baden-Wuerttemberg," predicted the then minister president, Hans Filbinger, before the Stuttgart Landtag. And DIE WELT surmised: "Wyhl is no village farce."

Six years later, the cleared construction site resembles a charming forest glade. In Baden-Wuerttemberg, the year 1980 passed without the lights even flickering. But the "nuclear energy option"--in the popular jargon of many party congresses--inflames temper as much as ever and is still capable of driving tens of thousands of people boiling mad into the streets. With the battle for Brokdorf in 1976, the struggle reached its high point of violence. In a "Sternmarsch" [protest march with marchers converging on assembly point from different directions] on Bonn in 1979, the environmentalists got fully 120,000 people to walk along.

The politicians, who after the 1973 oil crisis backed nuclear energy as an alternative as if this were a foregone conclusion, are now perplexed. The endless tug-of-war between Hamburg, Kiel, and Bonn over the nuclear power plant at Brokdorf is only the most spectacular symptom of this perplexity. All efforts to secure a broader endorsement from the people seem to have miscarried.

"Viewed as a whole, the results of the almost 8 years of informational work by the State and by industry are appalling," complains Prof Erich Maerz, director at the Institute for Chemical Technology of the Juelich Nuclear Research Facility. On the other hand, Rudolf v. Bennigsen-Poerder, president of VEDA AG [United Electricity and Mining Corporation], thinks he sees a growing acceptance. But according to the views of the Hamburg Senat, the construction of the nuclear power plant in Brokdorf should be put off another 3 years. Although Schleswig-Holstein's Minister President Gerhard Stoltenberg is willing to talk about it,

basically he adheres to the immediate continuation of construction. Plans for other power plants and storage sites for nuclear wastes do not yet go beyond preparatory studies and mere conceptual games. Under the circumstances, the statement by the federal chancellor before the German Industrial and Trade Association that it is "not only the business of the State to see to it that we have acceptance on this" already seems like the cry for help of a desperate person.

The picture which emerges from opinion polls is confusing. In July 1979--that is, shortly after the near-catastrophe at Harrisburg in the United States--60 percent of those polled viewed nuclear power plants as a serious danger. On the other hand, faced with increasingly scarce and expensive energy, a year later some 67 percent of respondents to an IHNID [Research, Opinion, News, and Information Service] poll approved of the building of additional nuclear plants.

In this regard, the possible potential for conflict in the construction of a nuclear power plant admittedly cannot be assessed. Because from past experience we know that most proponents turn into opponents when the reactor comes right up to their doors, when they become directly affected.

The anti-nuclear movement long ago freed itself of the charge of narrow-minded attitudes--as well as the suspicion of giving a cover to fellow-travelers of communism. Indeed, at first the people affected did argue from considerations of site selection--like the worthy vintners in Wyhl, who were worried about the sweetness of their wine as a result of the patches of mist coming from the cooling towers.

But quite soon the movement sustained itself on more general arguments against nuclear power: Nuclear radiation exposures, for example, and--occasionally striking one as apocalyptic--visions of the maximum credible accident (MCA). In this connection, it became more and more clear that the problems of the storage of radioactive wastes are by no means solved, although the nuclear industry claims this or depicts it as at most strictly a question of time.

For many environmentalists, the legally elected governments are no longer the embodiment of the will of the people, the champions of the public interest. The environmentalists condemn as an irresponsible way of acting toward the next generation that which our rulers, in concert with the nuclear industry, view as an entirely acceptable risk. Even when the discussion is conducted ever so patiently, any reconciling of these differences seems to be hopeless.

The radioactive seed of discord also intruded long ago into the established parties. It is a threat to the Social Democrats above all. While still under the spell of the violent protest in Wyhl, the Baden-Wuerttemberg SPD began to change its policy on this under its then chairman, Erhard Eppler. Young Socialists and other SPD Land associations have followed.

Consequently, the resolution by the Berlin federal-level party congress in December 1979, at which the chancellor wrung from the delegates at least a "limited development," could soon become wishful thinking. Whether the approval of nuclear power by most of the trade unions and the increasingly urgent

demands of the industrial associations alters this in any way remains doubtful. Since the Hamburg events, even the great nuclear-power coalition which exists between the Federal Government and the Land governments is in danger of shattering, if it does not already lie in ruins.

It is crumbling even in the FDP, as is shown by the "yes-and-no" decision of Schleswig-Holstein's Liberals 3 weeks ago. Only the Union parties (CDU and CSU) have refrained from "if's" and "but's" in their "yes" vote. In contrast to Gerhard Stoltenberg, their leaders--namely, Ernst Albrecht and Lothar Spaeth--are remarkably reserved as concerns political measures in favor of nuclear energy and against its adversaries.

Although a few years ago politicians and public utilities still had hopes that nuclear energy would gain acceptance on its own merits, as it were, on the basis of scientific authority, now they have hardly any hope left. The uncertainty about the urgency of nuclear power plants lies above all in the confused puzzle of figures for various energy forecasts.

Thus the Institute for Applied Ecology in Freiburg publishes a study bearing the title "Energy Turning Point--Growth and Prosperity Without Petroleum and Uranium," but a short time after its appearance, the Freiburg scientists are confronted already with public opposition from the Juelich Nuclear Research Facility, which the Ecology Institute in turn rebuffs as "unsound in large portions of its argument."

Whether he is pro or contra nuclear power: Depending on where his interests lie, the layman who is not well acquainted with forecasting hazards can freely take his pick of which authority he wants to believe. Even the protagonists of a steep nuclear-energy course are not in agreement about how many reactors are really needed now for our future energy supply. The reason: In the past, all energy forecasters have been way off the mark.

Although shortly before the first oil crisis in 1973 the Federal Government predicted an additional 510 million tons of hard-coal units of energy consumption for 1980, within only 7 years there emerged--despite repeated corrections--a glaring difference between the predicted value and the true energy consumption: The actual consumption was below the prediction by about 23 percent.

In the assessment of electricity consumption, the forecasters of the public utilities were even wider off the mark. Before the oil crisis, they figured on an annual growth in power consumption of 7 percent. This corresponds to a doubling within a decade. In fact, however, the electricity consumption grew at only half this rate. And in 1980, the rise vis-a-vis the previous year in the public power supply amounted to no more than only 1.3 percent.

But for Horst Magerl, chief executive secretary of the Association of German Electricity Works (VDEW) in Frankfurt, it is certain that: "The construction of an additional 32,000 megawatts of power-plant output is necessary by 1991. Of that, almost 75 percent must be from nuclear power plants." Basis for this requirement: Our electricity needs will grow an average of 4.6 percent per year up to 1985, and on an average by 3.8 percent until 1991.

Many experts consider these figures to be too inflated, in view of our spluttering engine of growth and an increasing conservation-mindedness on the part of industry and private households. Thus, in its newest estimates the BP (Benzin und Petroleum AG) assumes an annual growth rate of no more than 2.5 to 3 percent. Magerl considers this dangerous: "The short-term dip downwards of a trough of economic activity must not be determinative of considerations about the future by the electricity suppliers."

The wide spectrum of extrapolations into the future gives reason to believe that some day at least one research institute, association, or enterprise will be able to boast of clairvoyantly having registered our future energy consumption. Meanwhile, the multiplicity of the predictions is hardly any help in making a decision on the urgent question of how many nuclear power plants must be built in the future.

A comparison of the energy predictions for the year 2000 which have been produced since 1977 shows the great range of possible developments. Thus, the German Institute for Economic Research (DIW) in Berlin estimates the nuclear power plant capacity needed in the year 2000 to be 58,000 megawatts, somewhat more than half the value of 100,000 megawatts given in a BP study. But already both studies have been subjected to in-house revisions downwards.

This dilemma of long-range predictions of consumption was also known to the inquiry commission on "Future Nuclear Energy Policy," formed by order of the Bundestag, when it came out with its recommendations on future nuclear-energy policy last year in a 600-page-long paper. Thus, the commission presents four energy tracks which can be followed in the future up to the year 2030 (see WIRTSCHAFTSWOCHE, 22/1980).

Whereas the first two tracks count on a more or less forceful development of nuclear energy, in the remaining models even a complete abandonment of nuclear energy is possible if only strong conservation measures are practiced and the employment of alternative energies is played out to the very end. To be sure, a decision on whether nuclear energy can be dispensed with should not be taken before 1990.

But even this report, recognized by the Federal Government as a provisional compromise solution, is meeting with severe criticism. Thus, the Federation of German Industries (BDI) in Cologne complains that although the uncertainty of the assumptions is expressly stressed in this report, on the other hand "assumptions declared to be uncertain are treated as reliable facts."

The industrial representatives criticize especially the fact that the linkage between economic growth and other sectors of the associated social and political field have not been taken into account sufficiently in the calculations. Thus, a more vigorous conservation policy also requires greater investments and hence considerable growth. Primary industry above all, they say, is affected because of the manufacturing of construction materials, insulating materials, or pipes for the construction of solar collectors.

Nevertheless, with the commission's report a beginning has been made in getting away from assertions which are one-sided and biased by special interests.



Because in addition to seven Bundestag deputies and eight experts named by the fractions--with differing attitudes on atomic-energy utilization--citizens' initiatives and research institutes were also consulted on the separate questions. However, the BDI doubts that with the commission's work a condition for a broad agreement on energy policy has been established: The uncertainty and the aversion to making decisions demonstrated in the report is more likely to hinder the development of the aimed-at broad social consensus!

Certainly cost and price comparisons between electricity from nuclear energy and that from hard coal are also causing confusion, although the public utilities and most of the scientific institutes are in agreement that: Electricity from nuclear energy is cheaper than hard-coal electricity. Whereas in the nuclear power plant the fuel costs come to only 1.7 pfennigs per kilowatt-hour, the burning of hard coal tal'ies out at 6.5 pfennigs per kilowatt-hour. Also, the transport costs for coal represent an additional cost burden in power plants which are remote from coalfields. "Furthermore," says Gottfried Schmitz, spokesman for Prussian Electricity AG in Hannover, "the required flue-gas desulfurization again adds up to 3 pfennigs to the price of coal-generated electricity."

But the Battelle Institute in Frankfurt estimates that even without this additional cost burden, in the base-load range nuclear energy is 3.27 pfennigs cheaper than coal-generated electricity, assuming an annual utilization of capacity of 7,000 hours.

By and large, the public utilities corroborate these figures. Badenwerk AG of Karlsruhe gives a cost advantage for nuclear energy of 3.5 pfennigs when there are 6,500 hours of operation a year. Prussian Electricity calculates that its Unterweser Nuclear Power Plant, which was started up at the same time as its Mehrum coal-fired power plant on the Mittelland Canal, runs as much as 4 pfennigs cheaper than its power plant with coal-powered boilers.

But the spokesman of Badenwerk AG, Lutz Fleischer, admits that he becomes sceptical at times when he hears of price differences of even more than 5 pfennigs in favor of nuclear energy, "because the calculations involved are enormously difficult." Chrysanth Marnet, president of Stadtwerke Duesseldorf AG, gets even more pointed: "In this area, one often acts as if we had an ideal world. If the construction of a coal-fired power plant or a nuclear power plant is delayed, the interest on construction loans by itself eats up such an enormous amount of money that no comparisons are possible."

Thus it is also no surprise that there are alternative cost calculations as well. A Bremen study by the scientists Claus Klausen and Juergen Franke--which, to be sure, is based on the assumptions of the Freiburg ecology institute study, which are hotly disputed in the fuel and electricity industry--comes to the conclusion that atomic-power costs can run to as much as 24 pfennigs per kilowatt-hour. In comparison: The Juelich Nuclear Research Facility bases its calculations on an electricity price from nuclear energy of 10 pfennigs per kilowatt-hour.

But average figures such as are assumed here tell little about the true costs in individual service areas. Thus, the Stade and Obrigheim nuclear power plants,

with over 90 percent utilization of capacity, have achieved "fantastic values" (Badenwerk spokesman Fleischer). On the other hand, the nuclear power plants at Lingen, Wuergassen, and Brunsbuettel were run only 50 to 60 percent of the time.

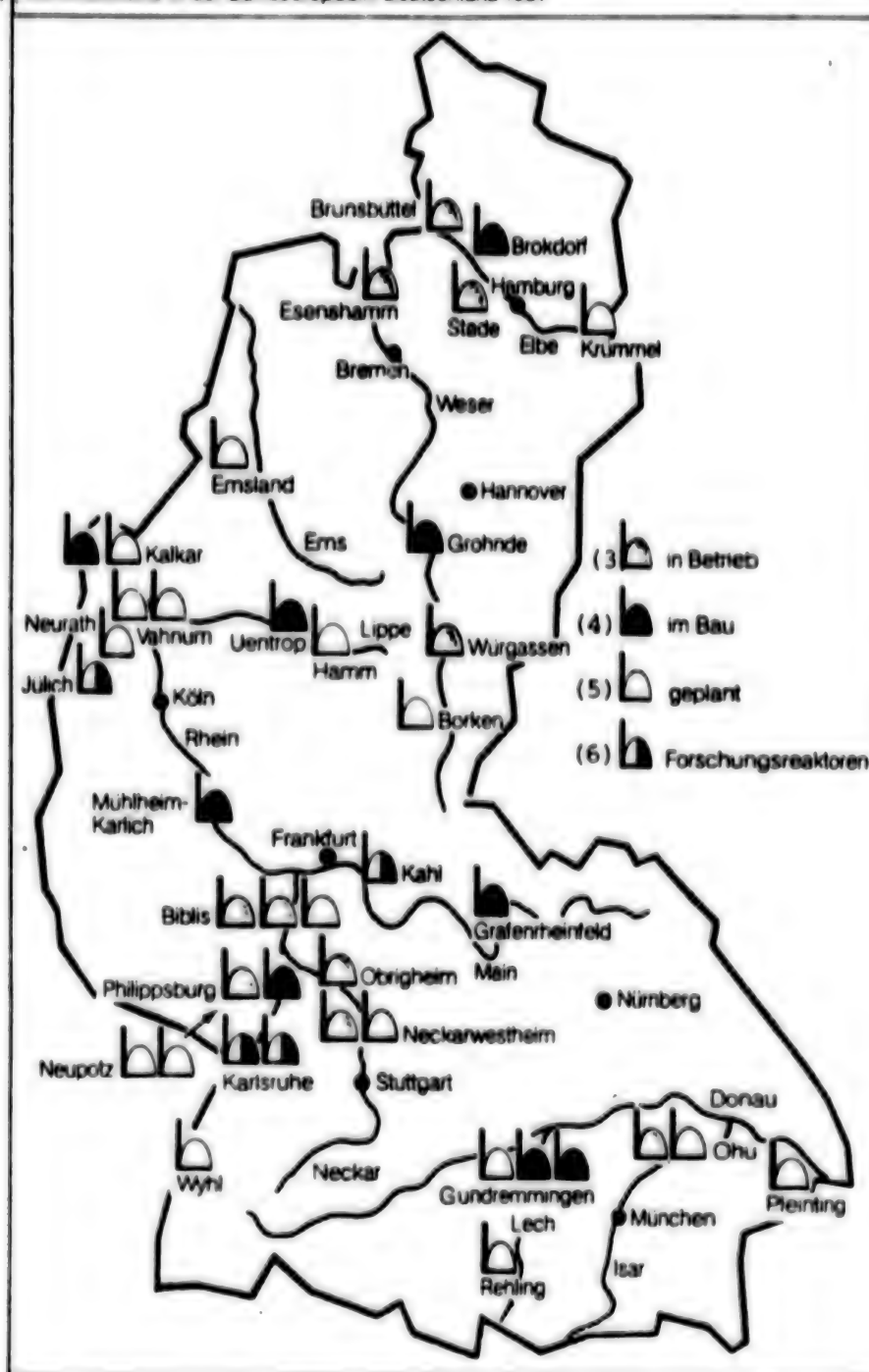
Therefore a four-room household in Hamburg consuming 1,200 kilowatt-hours a year pays 31.2 pfennigs per unit of energy. In this area, about 35 percent of the electricity comes from nuclear energy. On the other hand, in Duesseldorf a kilowatt-hour costs only 28.2 pfennigs--with no nuclear-energy component.

All these fine calculations are of little help to the ultimately unavoidable political decision. Even the vote of the Hamburg Senat to request a delay for Brokdorf is only the expression of a helpless uncertainty. In 3 years, the total amount of our information will scarcely be different than it is today, in any case not so different that an unequivocal decision will suggest itself.

Enlightenment will come, perhaps, from a historical glance back--in the next millenium. Then, France will be meeting its electricity needs for the most part from nuclear reactors, and its poor neighbor the FRG may gaze enviously across the borders. Unless the apocalyptic vision of a major MCA has occurred: Then nuclear power as the energy of the future will have been put long ago on the nuclear waste-heap of history.



- (1) Mehr als 40.000 Megawatt Atomstrom  
 (2) Kernkraftwerke in der Bundesrepublik Deutschland 1981



- Key:
1. More Than 40,000 Megawatts of Atomic Power
  2. Nuclear Power Plants in the FRG, 1981
  3. In operation
  4. Under construction
  5. Planned
  6. Research reactors

## COURT RULING THREATENS NUCLEAR POWER PLANT CONSTRUCTION

Hamburg DER SPIEGEL in German 23 Feb 81 pp 58-60

[Text] No more nuclear energy? A new type of objection to nuclear power plants could paralyze nuclear reactor construction in the FRG indefinitely.

Total strangers shouted "Bravo, congratulations" to him over the telephone, others cursed him: "Stone Age man." Siegfried Schleicher, a building contractor in Hamm, had "exercised his basic rights as a citizen" before the seventh chamber of the Arnsberg Administrative Court and, by doing so, possible rung in the end of reactor construction in Germany.

On Schleicher's objection, the court, on Monday of last week, temporarily halted construction of part of the Hamm-Schmehausen nuclear power plant--a project which North Rhine-Westphalia's energy policy-makers had hoped would assure a nuclear future.

The court found that a "material violation basic rights" existed: The North Rhine-Westphalian Ministries for Labor and Economics ought not to have approved an extension to the "building for feedwater containers and startup relief" before the change was announced and a public hearing arranged. The decision sets a new criterion for nuclear power plant construction.

Not only the thorium high-temperature reactor (THTR) in Hamm-Schmehausen is now in question as a result of the court's decision. "If this sets a precedent," prophesies North Rhine-Westphalia's labor minister, Friedhelm Farthmann, "everything will come to a stop in German nuclear reactor construction."

The Arnsberg decision still has a long road before it through the stages of appeal. Regardless of whether it is upheld or overturned, it will delay completion there and possibly elsewhere.

Until now it was not customary for German licensing authorities to release to the public those changes in the original design which occur during the construction phase. Minister Farthmann, responsible for the licensing of nuclear power plants in North Rhine-Westphalia together with Minister for Economics Reimut Jochimsen, said: "It is always a matter of improvements." For example, in the Hamm-Schmehausen nuclear power plant only half a dozen of 46 changes requiring approval have been announced beforehand and discussed in hearings. The remainder could be good for 40 court actions--a delay of many years.

Matters are not much better with the quick breeder reactor at Kalkar in the Rhineland. During the 8 years of its construction so far, about 50 changes and additional approvals have been granted. "At a conservative estimate," says a ministry official in Duesseldorf, "at least 15 of them ought to have been explained and discussed." If there are enough plaintiffs, nuclear power plant construction in North Rhine-Westphalia will start from the beginning again.

The administration had seen the danger approaching. In an internal paper of the Ministry for Economics in Duesseldorf from 16 December last year it says about the quick breeder in Kalkar, for example: The SNR 300, so far only registered for a Mark I core should now "be operated with a Mark Ia core,\* which does not have approval yet . . . It seems highly questionable whether it will be possible to survive renewed public explanation of the documents"--particularly since the change from I to Ia signifies a "substantial design change."

The Federal Constitutional Court had already condemned such behavior in December 1979. When the Muelheim-Kaerlich nuclear power plant in the Rhineland-Palatinate was changed from the originally approved plan "in fundamental safety-related points" without prior announcement, the judges in Karlsruhe had insisted that a new hearings procedure had to start with each important structural change.

The court could not define in advance what is "fundamental" and "safety-related" at German nuclear power construction sites. And since the court's decision the dilemma is obvious. Either all the unpublished supplemental approvals in recent years are quashed and new hearings are started, which costs a great deal of time and money. Or Bonn changes the nuclear law and expressly excludes addenda from public hearings. But that would curtail basic civil rights, a violation of the constitution.

The Arnsberg construction trial is a classic example that the third way--hoping that no one notices anything--leads nowhere. The THTR, in the view of former nuclear manager Klaus Traube, is a "phantom" which "for years has always been just 3 years 'from completion'" (DER SPIEGEL 8/1981); in the opinion of its builders it is not only more versatile but also safer than all other types of reactor. For politicians like Reimut Jochimsen in Duesseldorf, it marks the middle position between an anti-nuclear course and a "Yes" without ifs and buts.

Undoubtedly changes during construction are part of the development of every prototype. New findings and technical progress can repeatedly make new approval proceedings and examination and hearings necessary. But if "in future our honest efforts to improve the plants lead to our being punished," complains THTR designer Prof Rudolf Schulten, head of the nuclear research facility at Juelich, "we Germans will be unable to develop any technology."

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\* Core reactor Mark I and Ia: designation for cores with varying breeder and fuel elements.

## VNO TRIES TO CHANGE PUBLIC'S ANTINUCLEAR SENTIMENT

Amsterdam ELSEVIERS MAGAZINE in Dutch 3 Jan 81 pp 24-25

[Report by W.G.J. Bavelaar: "Public Opinion Can Still Be Changed"]

[Text] The Dutch employers are preparing a large-scale campaign to begin to influence the formation of opinion regarding the use of atomic power. They are breaking their relative silence and allocating millions to make clear to the Dutch people that atomic power is indispensable. They studied the methods successfully used by their colleagues in Sweden. The employers feel that the information in our country is one-sided and incomplete.

"No, we do not want an offensive against the antiatomic power movement in this country." The functionaries of the VNO (Federation of Netherlands Enterprises) reject as firmly as need be that description of their plans to initiate an intensive proatomic power campaign. And usages like "offensive" and "counter-attack" are not at all appropriate to the framework and VNO and its sister organization, the NCW [Dutch Christian Employers' Union] have in mind. No irritation is to be aroused. The tone must be harmonious.

After having studied the various reports by Energy Minister Van Aardenne, who is a convinced partisan of the broad-scale application of coal and uranium, for several months, the VNO and later the NCW reached the clear position that this country cannot permit itself the luxury of passing up the use of atomic power for its future energy supply. How can you make that clear to the people? That is a burdensome task, because the formation of public opinion seems to be monopolized by the often "incomplete" and "one-sided" information of the active antiatomic power movement. A delegation of the employers' organizations therefore went to Sweden, which decided by means of a referendum in favor of the further application of atomic power. After also having looked at the forms of popular consultation applied in other countries, they decided to choose the Swedish model. In 1 year the Swedish employers, who cooperated in their campaign with the workers and the utility companies, spent about 20 million guilders on a large-scale information campaign. The information in that campaign was not aggressive, it referred primarily to aspects of the job market and to the need not to neglect studies of alternative energy sources. Their approach worked. Because of that, the VNO and the NCW have decided there is something in beginning a campaign. During the coming "social discussion" of (atomic) power they are going to have something to say for themselves.

Is the start of the campaign not a bit late? There has been discussion in this country ever since 1974, when Minister Lubbers advocated the building of three atomic powerplants in his famous energy report. Groups of opponents of atomic energy have already made it clear that they see nothing further in this social discussion. Dr G.F.A. de Jong, director of industrial development in the VNO and sponsor of the campaign to be started: "Perhaps our initiative could have come sooner; then we would have had more time to influence public opinion. But the discussion is not formally beginning until this year. We are following the minister's procedure, and we feel it to be correct to join in the discussion at this stage. It is proper that there are already several positions. Now ours is also there. We say: without atomic power you cannot adequately guarantee the future energy supply. And we want to start explaining that to everyone else."

In the mean time the leadership of the VNO has given its fiat to the public information action, developed by several VNO staff members. Among other things, an internal notice said that opportunities are seen to win the discussion by removing emotions from it and for example to train attractive young people for discussions with antiatomic power groups. They must be contemporaries of the primarily "idealistic young people" of the antiatomic power groups. Their future opponents are also to be youths who can "argue the advantages of atomic power in a clear and explicit manner." Public relations experts and media and communications specialists are beginning to brainstorm on the question of how to approach the Dutch people. There is thought of providing information to the schools, organizing symposiums and congresses, putting together brochures and advertisements, training speakers and combating antiatomic power publications.

A general estimate of the costs suggests that an amount of 12 million guilders will be needed for the coming 3 years, to be provided by industry. An appeal will be made to the Ministry of Economic Affairs for financial contributions. There is a fund upon which social groups who take part in the popular discussion can draw. The antiatomic power movement has already asked for 5 million guilders.

Thus the industrialists have entered the field and are going to let themselves be heard in the folk meetings. "There, too, we have to try to explain what we feel to be important. It will not always be easy, especially not if you are shouted down. For it is naturally easier to be against than to be for. We have already made a modest beginning, but the meeting first had to vote whether our speaker could stay or whether he was to be thrown out. A proponent of atomic energy did not come off so well in the discussion," says De Jong.

Therefore the employers want to get a good start. They are thinking of establishing an association for a responsible energy policy. In that way other groupings could join in besides the industrialists' organizations. It does not seem realistic to suppose that the labor organizations will cooperate with the industrialists in the proatomic energy campaign. In Sweden that could happen. There, former Socialist Premier Palme pleaded for years for support of atomic energy.

The VNO director refers gladly to the developments abroad. "There, heads of government say that atomic power is necessary. In France, every so many months a new atomic power plant is opened. They are also further ahead there in the area of breeder reactors. The countries surrounding us are working hard to protect themselves from the situation which can arise if there is a structural



shortage of energy. And there will be, in the coming 10 to 15 years, no matter what scenario you look at--even that of zero growth--the Netherlands is still behind. If you listen to what they are saying in France, you hear it said, quite bluntly, that atomic power is the safest, the cheapest and the nicest form of power generation. And they say that as though it were so obvious, that even we, who have really given the matter some thought, were impressed by it. It has the glow of belief. Naturally, France is a different country, which is completely dependent; it does not possess any energy sources itself."

We still have our natural gas, even though it is available to an ever smaller extent to our industry or the electric power plants. The government wants to guard this natural resource as a strategic reserve and allocate it primarily for household use. The politically risky oil deliveries produce an oppressing view of the future. If we want to produce the same employment in 2000 without nuclear power, the oil imports have to be increased by 50 percent. But the increasingly expensive oil costs us a lot of money and employment. The OPEC countries' most recent price increase of an average of 10 percent means a decrease in our gross national product of nearly one half percent. Inflation will be increased an estimated three quarters and 10,000 jobs will be lost.

Uranium and coal will therefore have to be employed to keep the lamps burning. And to keep the machines running. Opponents of atomic power, however, are not much in favor of a massive switch to coal as a fuel.

De Jong of the VNO: "It is very possible that in the event of the massive use of coal so much opposition would be aroused to coal as a fuel that in the event of a choice between coal and atomic power, atomic power would be preferred."

For coal will again burden the air, which has become a bit cleaner since the early 1970's, and the environment: storage requires immense space, the waste products raise mountains, and rust, soot and common carbon dioxide are produced, and radiation, too, is to be feared. The climate will change. Coal will also become more expensive. Therefore some parliamentarians are asking that it be looked into whether Limburg in our own country might again play a role in the digging of coal. Mining experts hasten to explain that that is "a pure pipedream." At the current energy prices, it is irresponsible even to consider raising Limburg coal again, as by reopening closed mines. The Dutch coal, even though in gigantic quantities, lie too deep, the coal layers are too thin, and who wants to become a miner these days? Still, Minister Van Aardenne said he would discuss this new suggestion with State Mining (DSM), the holder of the concession for the closed Beatrix field.

The Dutch industrialists, who say they are very concerned with the continuity of the energy supply, are openly supporting this government's idea, that atomic power is one of the pillars on which the future energy delivery will have to be based. An organization like the VNO does not want to go so far as some VVD parliamentarians, who want work to start now on the construction of new atomic power plants. "The wish to start building now is just as great a misconception of the social discussion as statements of some political parties in which atomic power is radically rejected." Here, De Jong is aiming at one of the Labor Party's "battle points," in which the closing of the two existing power plants is called for. "If you promise to start talking with one another, you ought not to start shooting so soon."

One of the many studies among the Dutch populace showed that two-thirds of the people who expressed an opinion on atomic power felt that their opinion was based on inadequate information. "We also believe that there is more shading in the thinking among the people than is suggested by the political parties. It is not all that clear yet. Thus a considerable degree of influencing is possible," De Jong of the VNO says. He seems to be supported in his opinion by another recent study by the Institute for Psychological Market Research (IMP), commissioned by the VEEN, Association of Electric Company Operators in the Netherlands. The consumer would accept atomic power if that would guarantee the current level of prosperity. Economic considerations are more important than environmental aspects. The consumer feels confused by the often conflicting information. There is confidence in technology; the currently existing energy problems will be solved in the near to far future. Atomic energy, too, will be able to be applied safely in not too long a time, so said those questioned by the IMP.

De Jong: "At the moment that you start the discussions, you are confronted with a certain prejudice. That, too, is primarily because the irrational, feelings of anxiety play an important role. But when you see what interests are really involved--continuity of welfare and of the industries, of the level of that welfare, too, and political independence--then you really have to say: We feel that the matter that is at stake is so essential that we cannot accuse ourselves, or let the accusation be made, of giving up a discussion by default because we felt it would be too difficult."

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SWEDEN

BRIEFS

LEAK SHUTS DOWN REACTOR--A leak in the cooling system has arisen in reactor II at Ringhals Nuclear Power Station. The reactor will be shut down on Friday [20 March] for repairs, which will mean a closedown of around a week. The cost of this is estimated at 7 million kroner. The leak has developed in a pipe in the primary cooling system, that is, carrying the water which passes through the reactor itself. This water, which is radioactive, is leaking into the secondary water system, which in steam form drives the generators. Ringhals II is a pressurized water reactor; water in the primary cooling system is kept under high pressure to prevent its boiling. Because of the high pressure even small leaks lead to high losses of water. At present around 500 liters of water is leaking away every day. Ringhals II is Sweden's only pressurized water reactor in service. It is a problem child, with continual faults and shutdowns. [Excerpts] [LD231223 Stockholm DAGENS NYHETER in Swedish 20 Mar 81 p 9]

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